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Archival Preservation at the NPS

The National Park Service (NPS) Museum Management Program (MMP) holds over 22,500 linear feet of documents or almost 40 million items within the 378 parks. These collections range from archeological and natural history field records to significant manuscript materials by site-associated figures and organizations including architectural drawings and plans, correspondence, diaries, films, oral histories and photographs. These archival collections represent a major investment of expertise, knowledge, and baseline information that is often captured nowhere else in the service. Housed in thousands of buildings, these collections have many significant preservation problems from the short lifetime of magnetic and electronic media to the self-destructive nature of cellulose nitrate and ester films and acidic papers.

Since the NPS archival collections lack a large corps of archival preservation specialists, conservators, and archivists, item-level treatment of all archival documents is not a possibility. Happily, archival preservation theory provides the NPS with a clear roadmap for how to preserve these significant collections. Archivists undertake preservation work as a series of phased preventive conservation steps, starting with the most important improvements first. NPS archivists initially focus on saving the greatest number of materials by the least involved methods—such as by controlling the storage environment and preservation rehousing

Treatment work is done when preventive conservation steps fail or when materials must be stabilized for reformatting, exhibitions, or loans. Examples of materials needing treatment might be materials damaged by an emergency such as a flood or those that are highly self-destructive due to the materials of which they are composed, such as iron gall ink. Treatment work is minimal and is frequently batched so that groups of materials with similar problems are dealt with at once. This article will present the archival approach to phased preventive conservation within the NPS.

Assessing the Collection

As a first step, NPS archivists and archival contractors may evaluate collections and their related handling and usage policies, particularly the following:

- the institution's security[1]
- the institution's disaster planning procedures[2]
- the institution's access and usage policies[3] including duplication policies[4]
- the institution's storage environment and equipment[5]
- the institutional staff's rehousing and handling techniques[6, 7]
- the rehousing supplies[8]
- the physical condition of the collections[9]
- any health and safety issues posed by the collections[10]

There are a number of models for this systematic review and evaluation work. In the NPS, all parks must conduct Collections Management Plans (CMPs) to review the museum collections materials, including archival collections, for deficiencies in management on a regular basis.

Archivists and curatorial staff use the Collections Management Plan to define and later set priorities for addressing deficiencies reported in the Checklist for Preservation and Protection of Museum Collections. This checklist is entered using the Automated National Catalog System (ANCS+-the NPS Collections Management System). The checklist in turn is used to identify projects receiving funding from the NPS internal funding sources.

Archival Assessments are comprehensive reports on the status of the park's archives. AAs, can be performed as part of this CMP process to improve the quality of data incorporated in the Collections Management Plan or as a separate step. During these assessment processes, a trained archivist should:

- evaluate the storage, work, and research environments and rehousing materials
- review the archives procedures for processing, preservation, access, and use, including duplication
- determine the park staff's training and support needs for working with archival materials

- survey and evaluate each of the archival and manuscript collections at the collection-level in terms of the history of creation and usage, physical description, condition, intellectual contents, restrictions, arrangement and description, and similar issues

After this preliminary review the assessing archivist then prepares an action plan—both short term and long-range recommendations—and an overview of the park archival and manuscript collections at the archival collection-level for use in planning the next steps in collections management and preservation. Once a CMP or Archival Assessment has been written with this information, more detailed planning for individual collection preservation can be done effectively and resources can be requested.[11] At the NPS, item-level collection condition surveys are done on archival materials very rarely and usually only with the most valuable collections[12] or those going on exhibition, loan, or out for reformatting.

Outside of the NPS, *The Conservation Assessment Guide for Archives*[13] covers much of the same turf. Non-NPS archivists might use this publication's checklist and report-production procedures to do much of the same work as the AA.

Reviewing New Acquisitions

Before NPS archivists bring new collections into the institution, they review the materials for potential problems such as biological contamination (insects, vermin, or mold)[14] chemical contamination (including asbestos contamination or fumigation chemicals), and self-destructive materials (such as cellulose nitrate).[15] If the archivist finds these problems, the collection must be stabilized before acquisition—often through freezing to kill insects and vermin or through professional cleaning by an approved contractor.

Archivists also evaluate materials against the park's Scope of Collections Statement (collecting policy)[16] to ensure that the materials are appropriate for addition to the park museum collections. Some materials may require reformatting (microfilming, photography, xerographically copying)[17] so that usage surrogates can be made for researchers. Archivists then arrange, describe, and rehouse collections in stable materials on a collection-by-collection basis.[18] Most rarely, conservators individually assess, stabilize and/or treat materials of exceptional value.

Preparing Good Archival Policies and Procedures

In the NPS, as in most repositories holding archival and special collections, the first line of defense is a good set of policies and procedures. In the NPS, the *Museum Handbook* (MH) recommends policies relating to preservation, while the *Conserve O Gram* (COG) technical leaflet series (available on the Web at http://www.cr.nps.gov/csd/publications/index.htm> recommends preservation procedures. Among the essential elements for archival and special collections are:

- *an emergency operations plan*, sometimes called a disaster planning and response plan[19]
- *researcher registration procedures,* to track who is using what collections and when [20]
- *security policies and procedures,* including researcher monitoring and security systems[21]
- *staff and researcher handling policies,* procedures, and training[22]
- *loan policies,* for lending archival materials for exhibitions[23]
- *duplication policies and procedures,* for producing photographic, microfilm, digital, and xerographic copies[24]
- *processing plans and procedures,* including rehousing, arrangement, and description standard operating procedures[25]

The second line of defense against collection deterioration is always maintenance of a sound storage environment.

Ensuring a Stable Environment:

In the NPS, archival storage, work, and reference rooms are expected to meet certain basic standards indicated in both the *Museum Handbook* and in the *Conserve O Grams,* such as maintaining the following:

- *safe storage spaces* far from natural or man-made hazards (flood plains, major roads, polluting factories, and geological fault lines). For archival storage, buildings need good floor loading, up-to-code utilities; excellent structural integrity; good fire detection and extinguishing systems; sound and fire resistant construction; no pipes or open water sources overhead; and no flammable materials storage, including nitrate in collections[26]
- *a constant and appropriate temperature and relative humidity 24 hours a day for 365 days a year* While a RH of 55-65% maximizes flexibility and minimizes mechanical damage to paper; a RH that is above 70% ensures biological dam-

age from mold, insects, and vermin. Sudden rises of RH or drops in temperature can cause condensation, leading to mold. High temperature and low relative humidity (RH<40%) causes paper, leather, glue, and magnetic and photographic binders to become dry, cracked, stiff, shrunken, or brittle. If reference usage of originals (not reformatted copies) is frequent, keep reading room and storage spaces at similar temperatures, such as 68 F (±2°) and 45% RH (±2%)r[27]

- *positive air pressure with filtered and well circulated air* that does not have significant contamination by air pollution, such as by air intake valves placed near parking lots or roads. Hydrogen sulphide, nitrogen dioxide, and sulphur dioxide from fossil fuels can combine with humidity to produce acids that destroy archival materials. Off-gassing from new wood or board furniture, carpeting, nitrate film, and paints can be harmful. Ozone from copy machines, cars, and some HVAC filter systems can oxidize archival materials.
- *good housekeeping procedures,* such as regular use of appropriate cleaning supplies (don't use solutions with alum, ammonia, chlorine, oil, or peroxide) and techniques (bench brush boxes and damp mop floors with a near dry mop), will limit the damage caused by microorganisms, molds, fungi, water-attracting particles, and abrasive materials in dust[28]
- *appropriate light levels,* such as 50-100 lux (5-10 footcandles). Use UV filters and shades. Keep storage spaces dark to protect light-sensitive color dyes, inks, and papers; photos; and copy processes (carbon paper, facsimilies, hectographs, thermographs)[29]
- *an integrated pest management program* for trapping, identifying, killing, and making storage spaces and collections unattractive to pests that eat archival materials, such as beetles, booklice, cockroaches, rodents, silverfish, and termites[30]
- *appropriate storage equipment,* such as powder coated and braced steel shelving that holds at least 30 lbs of weight per square foot at least 4-6 inches off the floor[31]
- *good fire detection and suppression systems,* such as smoke detectors and heat activated sprinklers that have an emergency shut-off[32]
- *good water detection systems* and drainage/piping/guttering systems that are far from storage areas with no open water above the storage space
- *good security,* including intrusion detection and alarm systems wired to security staff [33]

Note: A single storage environment is not suitable for all materials. For example: photographic materials significantly extend their life expectancy in cold storage.[34] The Image Permanence Institute has developed a time-based monitoring system and a device called a preservation environment monitor or PEM that allows archivists to compare how long their various types of materials might last in the various storage spaces that are available.[35]

Rehousing Collections

Besides managing the archival storage, work,[36] and research room environment, NPS archivists must rehouse archival and management collections in appropriate materials.[37] The NPS maintains a supply catalog, *Tools of the Trade,* and a large number of indefinite quantity contracts with high quality archival supply sources. These resources ensure that park staff:

- obtain the lowest possible prices on supplies
- utilize appropriate housing and storage materials
- understand the full range of storage options

Many of audio-visual, electronic, or paper-based archival documents have specific housing requirements. For example, most photographic materials must be housed in neutral pH photographic housing that passes a specific test for purity, called the PAT or photographic activity test. Blueprints should not be stored in buffered housing. Cellulose ester and nitrate negatives and film and most 20th-century paper materials require buffered housing and cold storage. For guidance, see the COG series available on the Web at <http://www.cr.nps.bov/csd/publications/index.htm> and specific information on storage standards.[38]

During rehousing, archivists undertake simple preservation work, such as:

- opening and flattening rolled or folded items
- simple cleaning of batches of materials
- removing of paper clips, staples, and other attachments[39]
- identification of materials requiring further work

This work can be done by trained park staff who have been taught how to handle materials and when to avoid these activities.

Identifying Self-Destructive Materials

Inherent fault refers to documents created out from materials that will inevitably self-destruct, usually at a fairly rapid rate due to the

materials out of which they are composed. Self-destructive materials produced prior to the mid 1850s include friable media (such a charcoal, chalk, crayon, and graphite), iron gall ink,[40] letter press books, and watercolors. After 1850, the list of materials with inherent fault expands to include widespread use of:

- acidic wood pulp paper,
- light, temperature, and humidity sensitive photographic media,[41]
- magnetic media such as audio and videotape,[42]
- colored and copy papers, inks, and dyes,[43] and perhaps worst-of-all,
- electronic media[44]—which is dependent upon software, hardware, and data migration for long life.[45]

Determining how to save these materials is often a matter of determining the following:

- why the documents were kept in the first place—their evidential, information, associational, artifactual, and administrative values to the park[46]
- what their current condition and life expectancy is[47]
- what are the needs of the potential audience of users and other stakeholders in the collections, such as donors or property rights holders[48]

Prioritizing Self-Destructive Materials for Reformatting and Treatment

Most self-destructive archival materials can be prioritized for reformatting and treatment into high, medium, and low-risk categories. High risk materials are treated or reformatted first.

High Risk Materials. The highest risk materials are primarily chemically unstable which results in their self-destructing and damaging or contaminating nearby materials, as well as posing health hazards to staff and researchers who use them. Classic examples of high risk materials are:

- *Cellulose nitrate negatives and motion picture films,* which self-destruct over time and pose fire and health hazards, as well as causing damage to nearby materials[49]
- *Materials with biological or chemical contamination,* such as mold, insects, vermin, or asbestos, that pose risks of information loss and health hazards[50]
- *Materials that are self-destructing due to inherent fault,* such as iron gall ink, leather with red rot, very acidic and brittle paper, cellulose ester film and negatives, and those items that may be causing damage to nearby materials, such as materials that have oozing tape.

Moderate Risk. Moderate risk materials are experiencing primarily mechanical or physical damage due to their housing and handling, and the characteristics of the materials of which they are composed (e.g., folding strength, friable media, fading color, stained items, or ripped, warped, or cracked items). Other factors being equal, smaller format materials such as microforms, should be given top priority for preservation as more information is being lost

Low Risk. Low risk materials are more long-lived processes in undamaged condition and in adequate storage conditions but they may have slight damage, such as light soiling, foxing, or fading.

Undertaking Collections Reformatting

The highest priority materials listed above are prime candidates for reformatting (copying in a new format such as microfilm) and then placement of the original in cold storage. Before reformatting, however, they should be:

- replaced with completed separation sheets that indicates their new location and maintains original order and provenance of the collection,
- checked for condition and stabilized by a conservator if necessary
- rehoused, labeled, have necessary loan forms completed, and be cataloged at the item-level

Next, reformat the materials by making a photographic, micrographic, xerographic, or digital copy to meet reference needs. Materials to be reformatted may be:

- particularly high value and/ or high usage and/or at highest risk
- required to meet a special project criteria such as a publication or exhibition
- essential for access if the original is deteriorated, oversize, or housed off-site
- necessary to meet essential park criteria, such as health and safety issues, the collecting statement, mission, anniversary plans, or interpretive or educational needs

Handling Treatment

Treatment is the rarest of the archival conservation options. The likeliest materials to be treated include:

- high value and high usage materials that have been placed at high risk due to inherent fault
- flood, fire, or pest damaged or contaminated collections (e.g., asbestos, mold, pesticide, or

other contamination) that must be stabilized before being used
- materials needing stabilization before they can be loaned out for exhibitions or reformatting

Such materials are most likely to have batched treatments of similar groups of materials, such as humidification and opening of groups of architectural drawings or cleaning of a series of letters, or mending of a group of ripped documents. NPS conservators are likely to be asked to conduct collection condition surveys for groups of such materials followed by batched treatment to stabilize the materials. Individual treatments of endangered single items are the rarest forms of conservation.

As we reach the millennium, larger portions of the NPS holdings consist of magnetic and digital materials. Magnetic media, such as audio and videotapes and electronic records, are increasingly becoming a major factor in NPS conservation planning. Electronic records pose even greater challenges. Endless reformatting and quality control is the preservation wave of the future for these materials.

Summary

Archival preservation is the art of the possible done most effectively by professionals trained in assessing collections and progressively improving policies and procedures, storage conditions, housing, collections handling and care, and identifying appropriate batched treatments that can be done with minimal resources. The archivist's first action when dealing with a collection is a collection survey and evaluation procedure. During this process the archivist gathers baseline information on collection scope and condition, policies and procedures, the storage and housing environment, and makes recommendations for improvements.

The archivist's first line of defense against collection deterioration is to prepare a good set of policies and procedures for handling, processing (arrangement and description), emergency planning and response, and access to and usage of collections. As a second line of defense against deterioration, the archivist maintains a secure and environmentally controlled storage space. The archivist's third line of defense is rehousing and processing collections appropriately including the removal of staples and potentially damaging items. The fourth line of defense is batched preservation treatment of groups of materials, such as basic cleaning, reformatting, and the flattening of rolled items. Item-level conservation treatment, the fifth level of activity, is used for important, special and fragile items.

Phased archival preservation allows rapid response for planning, effective use of limited resources, and the "biggest bang for the buck." For those with imagination, energy, and the ability to innovate, archival preservation offers an exciting opportunity to save significant resources for historians, scholars, educators, students, and managers of tomorrow.

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